METHOD AND APPARATUS FOR PRESERVING PRECISE EXCEPTIONS IN BINARY TRANSLATED CODE

ABSTRACT OF THE DISCLOSURE

The present invention provides a system and method for determining the cause

5 of an exception and for reliably handling precise exceptions in a computer system that executes a plurality of operations in parallel. Binary compilation techniques are used to port code from a foreign architecture to a host architecture but in order to exploit the parallelism of the host processor architecture in binary translated code, the code must optimized by extracting the inherent parallelism of the foreign code while maintaining precise exceptions.

10 Because the optimization process violates precise exception order, the host computer system uses a speculative mode of execution whereby the host computer system puts a speculative value into the destination register. To denote that a speculative value is stored in the register, an additional bit is associated with every host register to indicate that the operand is speculative. It is only after the speculative value is consumed by an operation in non-

15 speculative mode, that a real exception will be invoked. The method and apparatus of the present invention further preserves the data and conditions that gave rise to the exception. The present invention minimizes the time to recover from an exception by minimizing the side effects that must be handled to recover from exceptions but extracts performance improvements associated with executing operations in parallel while achieving precise

20 exception maintenance.

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